RESEARCH ARTICLE

PREVALENCE OF PULMONARY TUBERCULOSIS AND HUMAN IMMUNODEFICIENCY VIRUS AMONGST PATIENTS ATTENDING THE INFECTIOUS DISEASE HOSPITAL (IDH), CALABAR, NIGERIA

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ABSTRACT

Pulmonary tuberculosis (TB) is a common deadly infectious disease caused by *Mycobacteria* mainly *Mycobacterium tuberculosis*. The human immunodeficiency virus (HIV) depletes the T-helper cells, reduces the patients immunity and subsequently exposes the patients to opportunistic infection like Tuberculosis. A total of 284 (152 males and 132 females) patients were randomly selected from the Infectious Disease Hospital, Calabar, Nigeria and examined for the prevalence of tuberculosis (TB) in association with Human Immunodeficiency Virus (HIV) from June 2008 to December 2008 using Zeihl Neelson (ZN) acid fast bacilli method. The total percentage prevalence of TB reported was 114 (40.14%) and HIV only was 137 (48.24%) while a total of 77 (27.11%) prevalence was reported for both TB and HIV occurring concurrently. Prevalence was higher in 20 – 39 years age range than other age groups. Inspite of the concerted efforts in the control of HIV and TB by Government and Non-Governmental Agencies, the present study indicated that these infections are still very prevalent in Nigeria. However, since HIV predisposes victims to other infections like TB, it is pertinent that more efforts should be intensified in the control of HIV in Nigeria.

INTRODUCTION

Pulmonary tuberculosis (TB) is a common deadly infectious disease caused by *Mycobacterium* mainly *Mycobacterium tuberculosis*. Tuberculosis mainly attacks the lungs but can also affect other parts of the body. Tuberculosis is the seventh most important cause of global premature mortality and disability (Murray and Lopez, 1996) and is projected to remain one of the ten leading causes of disease burden globally even in the year 2020 (Murray and Lopez, 1997). Because of a powerful interaction between pulmonary tuberculosis (TB) and the human immunodeficiency virus (HIV), TB incidence rate is rising in sub-Saharan African and may rise in Asia. A steady increase in TB cases has also been reported by the World Health Organization to be occurring worldwide with nearly 2 billion people, representing one-third of the world's population suffering from the disease (NIAID, 2005). In a similar case, CDC (2006) has also reported that about 8 million deaths are added to this figure with about 2 million deaths resulting from the ailment annually. The human immunodeficiency virus (HIV) depletes the T-helper cells, reduces the patients immunity and subsequently exposes the patients to opportunistic infection like Tuberculosis. In tertiary institutions all TB patients are undergo HIV screening test. And about 40% of all TB patients are HIV positive

(WHO, 1987). According to Golleti and Fauli (1997), the incidence of HIV associated with TB in increasing worldwide and will continue to increase in future, especially in developing countries. HIV – infected individuals are more susceptible to TB infection upon exposure to the microbes. In addition, TB can increase HIV replication either in local tissue sites or at a systemic level thereby accelerating the progression of Acquired Immunodeficiency Syndrome (AIDS), (Golleti & Fauli, 1997). The objectives of the present study was to assess the prevalence of pulmonary tuberculosis in association with the Human Immunodeficiency Virus infections amongst individuals who presented themselves for examination in the Infectious Disease Hospital in Calabar, Nigeria.

MATERIALS AND METHODS

Sample collection

A total of 284 patients were randomly selected from the Infectious Disease Hospital, Calabar, Nigeria and examined for the prevalence of tuberculosis in association with Human Immunodeficiency Virus (HIV) from June 2008 to December 2008. A total of 284 sputum and blood samples were collected from both sexes using wide specimen containers. This included 152 males and 132 females. The purpose of this

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Table 1: Age range and percentage prevalence of Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) among patients attending the Infectious Disease Hospital (IDH), Calabar, Nigeria

Age range	No. of individuals examined	No (%) prevalence of TB	No (%) prevalence of HIV	No (%) prevalence of TB & HIV
0 – 19	58	27 (46.55)	33 (56.90)	15 (25.86)
20 – 39	156	58 (37.18)	79 (50.64)	53 (33.97)
40 – 59	60	25 (41.67)	21 (35.00)	7 (11.67)
60 & above	10	4 (40.00)	4 (40.00)	2 (20.00)
Total	284	114 (40.14)	137 (48.24)	77 (27.11)

Table 2: Age range and percentage prevalence of Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) among patients attending the Infectious Disease Hospital (IDH), Calabar, Nigeria

Age range	No of individuals examined		No (%) prevalence of TB		No (%) prevalence of HIV		No (%) prevalence of TB & HIV	
	Male	Female	Male	Female	Male	Female	Male	Female
0 – 19	29	29	14 (48.28)	13 (44.83)	17 (56.62)	16 (55.17)	7 (24.14)	8 (27.59)
20 – 39	81	75	33 (40.74)	25 (33.33)	37 (45.68)	42 (56.00)	26 (32.09)	19 (25.33)
40 – 59	36	24	14 (38.89)	12 (50.00)	10 (27.78)	11 (45.83)	4 (11.11)	3 (12.50)
60 & above	6	4	3 (50.00)	1 (25.00)	2 (33.33)	2 (50.00)	2 (33.33)	0 (0.00)
Total	152	132	63 (42.11)	51 (38.64)	66 (43.42)	71 (53.79)	39 (25.66)	30 (22.73)

study was well explained to the patients and their consent were obtained prior to the commencement of the study.

Laboratory analysis

Diagnosis of tuberculosis using Zeihl Neelson (ZN) acid fast bacilli method was employed in the study (Madison, 2001). The 284 blood samples were screened for the presence of HIV antibody using latex aggregation method. (Camillus HIV-1/HIV-2) as described by Cambridge Diagnostic Ireland Ltd.

RESULTS

The total percentage prevalence of TB reported was 114 (40.14%) and HIV only was 137 (48.24%) while a total of 77 (27.11%) prevalence was reported for both TB and HIV occurring concurrently (Table 1). A total of 152 male and 132 female patients were examined throughout the entire study. The percentage prevalence of TB reported for male and female patients were 66 (43.42%) and 71 (53.79%) respectively (Table 2). The concurrent cases of both TB and HIV had the percentage prevalence of 39 (25.66%) and 30 (22.73%) for male and female patients respectively (Table 2). There were no significant difference in the prevalence of TB, HIV, and both TB and HIV occurring concurrently between male and female patients (P > 0.05).

DISCUSSION

Studies on the prevalence of pulmonary Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) amongst patients attending the infectious Disease Hospital (IDH) were carried out between June to December 2007. Laboratory diagnosis for pulmonary Tuberculosis using Ziehl – Neelsen staining method revealed an overall prevalence of 114 (40.14%). Earlier reports in Ile- Ife, Nigeria showed that more males, 465 (51.8%) compared to 433 (48.2%) females were infected with TB and more cases of tuberculosis were reported and treated during the rainy season than at the dry season, The highest incidence was recorded among people aged 45 years and above (Elegbe *et al.,* 1986). Also, Male subjects had a higher incidence of 35.6%, compared to 26.9% in females ((Itah and Udofia, 2005). Similarly, Okodua *et al.,* (2004) and

Okodua *et al.,* (2004) reported that of 405 persons sampled, males 54(13.3%) and females 34(8.4%) where positive for TB. In the present study, with respect to sex, males were more infected than females recording 64 (42.11%) and 51 (38.64%) prevalence respectively even though there was no significant difference between the two sexes (T – test, P > 0.05). Also Bizimungu and Butare (1993) in Rwanda found the prevalence rate of TB alone to be more in males than females. In another study carried out by Ellner (1997), TB was more prevalence among males than females recording 17 (11.18%) and 12 (9.01%) respectively.   Similarly, Obi *et al*, (2008) in his studies on the distribution of clinically diagnosed pulmonary tuberculosis in Ebonyi State, Nigeria found 323 (34%) males and 235 (24%) females infected.   Hence males were consistently more infected than females. Males were known to indulge more in the pre-disposing factors to the infection than females. The major pre-disposing factor is the high level of poverty which resulted in lack of basic and essential amenities such as potable water, good food and good housing. Also, Davies *et al*, (2006) reported that in addition to other factors, smoking more than 20 sticks of cigarette every day could increase the risk of succumbing to TB infections. An overall prevalence of 137 (48.24%) was reported for HIV amongst the patients examined. HIV alone among male and female subjects recorded the prevalence rate of 66 (43.42%) and 71 (53.79%) respectively. This result showed that HIV prevalence was higher among females than males although there was no significant difference (T-test, P > 0.05). This result is similar to a study carried out by Bizimungu and Butare (1993) in Rwanda where the HIV prevalence was higher among females than males. Also according to Ellner (1997), the prevalence rate for HIV alone was higher in females. This can be explained by the fact that the prevalence of HIV is the cause of progressive and ultimate reduction in cell-mediated immunity. Infact HIV infection increases the risk of TB through reactivation of latent infection and development of primary infection (Ellner, 1997).

The overall percentage prevalence of TB and HIV occurring concurrently in this study was 77 (27.11%). Male and female subjects reported 39 (25.66%) and 30 (22.73%) for the concurrent infection respectively although there was no significant difference statistically (P > 0.05). Earlier works by

Okodua *et al.,* (2004) reported that of 405 persons sampled TB-HIV coinfection recorded for males 16(4%) and females 39(9.6%). People in the age group 31-40 years old had the highest incidence (12.6%) while 41-50 years old subjects had 11% in Edo state, Nigeria. In a related study Ogbonnaya *et al.,* (2011) reported that out of 86.4% Tuberculosis patients screened for HIV, only 54.7% tested Positive for HIV in Ebonyi State, Nigeria. Inspite of the concerted efforts in the control of HIV and TB by Government and Non-Governmental Agencies, the present study indicated that these infections are still very prevalent in Nigeria. However, since HIV predisposes victims to other infections like TB, it is pertinent that more efforts should be intensified in the control of HIV in Nigeria.

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